

## ABSTRACT OF THE DISCLOSURE

A process and laser system for in vitro and in vivo pain research, pain clinical testing and pain management. In preferred embodiments of the present invention a diode laser operating at a 980 nm wavelength is used to produce warmth, tickling, itching, touch, burning, hot pain or pin-prick pain. The device and methods can be used for stimulation of a single nerve fiber, groups of nerve fibers, nerve fibers of single type only as well as more the one type of nerve fibers simultaneously. The present invention is especially useful for research of human/animal sensitivity, pain management, drug investigation and testing, and psychophysiology/electrophysiology studies. The device and methods permit non-contact, reproducible and controlled tests that avoid risk of skin damage. Applicant and his fellow workers have shown that tests with human subjects with the process and laser of the present invention correlate perfectly with laboratory tests with nerve fibers of rats. The device and the methods can be applied in a wide variety of situations involving the study and treatment of pain. Preferred embodiments of the present invention provide laser systems and techniques that permit mapping and single mode activation of C fibers and A-delta fibers.